

Appl. No. : 10/658,114  
Filed : September 8, 2003

## REMARKS

Claims 1, 3-26, 37-42, and 45-50 are currently pending. Claim 1 has been amended. Support for the amendment is found in the specification and claims as filed.

### Claim Rejection - 35 U.S.C. §103(a) - Yamada et al. in view of Berger et al.

Claims 1, 3-25, 37-42, 45-47, and 50 have been rejected under 35 U.S.C. §103(a) as obvious over Yamada et al. (U.S. 5,331,180) in view of Berger et al. (“Porosity superlattices: new class of Si heterostructure”). It is well settled that the Examiner “bears the initial burden of presenting a *prima facie* case of unpatentability...” *In re Sullivan*, 498 F.3d 1345 (Fed. Cir. 2007). Until the Examiner has established a *prima facie* case of obviousness, the Applicant need not present arguments or evidence of non-obviousness. To establish a *prima facie* case of obviousness, the Examiner must establish at least three elements. First, the prior art reference (or references when combined) must teach or suggest all of the claim limitations: “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 165 U.S.P.Q. 494, 496 (CCPA 1970); *see also M.P.E.P. § 2143.03*. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986); *see also M.P.E.P. § 2143.02*. And finally, the Examiner must articulate some reason to modify or combine the cited references that renders the claim obvious. Merely establishing that the claimed elements can be found in the prior art is not sufficient to establish a *prima facie* case of obviousness:

As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (emphasis added).

Instead, the Court has made clear that the Examiner must establish a reason one of skill in the art would have combined the elements of the prior art, and that such reason must be more than a conclusory statement that it would have been obvious.

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *See In re Kahn*, 441 F.3d 977, 988 (C.A.Fed.2006) (“[R]ejections on obviousness grounds cannot

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be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741 (2007).

Applicants respectfully submit that the pending claims as amended are not obvious under 35 U.S.C. § 103(a) for the reasons detailed below.

Pending Claim 1 recites “[a] photovoltaic device, the device comprising: a first layer comprising a first semiconductor material comprising a first conductivity type; a second layer comprising a second semiconductor material of a second conductivity type, wherein the second conductivity type is opposite the first conductivity type; and a third layer consisting of a single elemental semiconductor material, wherein the third layer is situated between and contacts the first layer and the second layer, wherein the third layer is a translucent porous layer and diffusion barrier having a thickness of from about 1 nm to about 50 nm, and wherein the third layer is of a homogeneous porosity.”

In the Office Action, it is acknowledged that Yamada et al. does not teach a thickness of the third layer (porous layer) of from about 1 nm to about 50 nm between the first and second layers. It is asserted that Berger et al. teaches a layer such as Applicants’ third layer. Applicants respectfully disagree. Berger et al. teaches porous superlattices comprising alternating regions with ‘high’ and ‘low’ porosity – not a layer of homogenous porosity. For example, the structure shown in Figure 1 is a porous layer with alternating “Layers I” and “Layers II”, wherein Layers I have a thickness of 20 nm and 64% porosity and wherein Layers II have a thickness of 200 nm and 84% porosity. The total thickness of the porous structure shown in Figure 1 is at least 1.5 micrometers, not from about 1 nm to about 50 nm as recited in Claim 1. Applicants also note that Figure 2 of Berger et al. shows that the porous superlattice has, at least in some parts of the spectrum, a high reflectivity. A high reflectivity is inconsistent with a translucent layer, which must, by definition, allow light to pass through diffusely.

Accordingly, Applicants respectfully request that the rejection of the claim be withdrawn.

Claim Rejection - 35 U.S.C. §103(a) - Yamada et al. in view of Berger et al. and Suzuki et al.

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Claim 26 has been rejected under 35 U.S.C. §103(a) as obvious over Yamada et al. in view of Berger et al. and further in view of Suzuki et al. ("U.S. 6,644,156").

As discussed above, Yamada et al. and Berger et al. do not teach or fairly suggest, *inter alia*, a third layer as recited in Claim 1. Suzuki et al. is cited for teaching a layer comprising macro etch pits, as well as layers having p-type and n-type conductivity; however, Suzuki et al. does not overcome the deficiencies of Yamada et al. and Berger et al. as to the third layer. Accordingly, Applicants respectfully request that the rejection of the claims be withdrawn.

*Claim Rejection - 35 U.S.C. §103(a) - Yamada et al. in view of Berger et al. and Fonash et al.*

Claims 48 and 49 have been rejected under 35 U.S.C. §103(a) as obvious over Yamada et al. in view of Berger et al. and further in view of U.S. 6,399,177 ("Fonash et al.").

As discussed above, Yamada et al. and Berger et al. do not teach or fairly suggest, *inter alia*, a third layer as recited in Claim 1. Fonash et al. is cited for teaching a porous structure made of silicon, germanium and carbon; however, Fonash et al. does not overcome the deficiencies of Yamada et al. and Berger et al. as to the third layer. Accordingly, Applicants respectfully request that the rejection of the claims be withdrawn.

*Conclusion*

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns that might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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